In the Claims:

1. *(cancelled)*

2. *(cancelled)*

3. *(cancelled)*

4. *(cancelled)*

5. *(cancelled)*

6. *(cancelled)*

7. *(cancelled)*

8. *(cancelled)*

9. *(cancelled)*

10. *(cancelled)*

11. *(cancelled)*

12. *(cancelled)*

13. *(cancelled)*

14. *(cancelled)*

15. *(cancelled)*

16. *(cancelled)*

17. *(cancelled)*

18. *(cancelled)*

19. *(cancelled)*

20. *(new)* A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the number of radiation counts for each of at least two substantially distinct time slices occurring during the time period the source passes the apparatus; and

Calculating a correlation of the measured counts with respect to either all of the at least two time slices or a subset of the at least two time slices.

21. *(new)* The method of Claim 20 where the correlation step is comprised of calculating for each of the at least two time slices, the probability that the radiation counts in the time slice came from background and determining whether all of the calculated probabilities are less than or equal to a threshold value.

22. *(new)* The method of Claim 20 where the correlation step is comprised of calculating for each of the at least two time slices, the probability that the radiation counts in the time slice came from background and determining whether at least two of the calculated probabilities are less than or equal to a threshold value.

23. *(new)* The method of Claims 20, 21 or 22 where the measuring step detects the counts occurring within a pre-determined spectral window.

24. *(new)* The method of Claim 23 where the spectral window is comprised of at least one energy channel.

25. *(new)* A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts for each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

Calculating for each time slice within a subset of the plurality of time slices the probability that the radiation counts for the time slice came from background.

26. *(new)* The method of Claims 25 where the subset size is between 1 and the number of time slices in the plurality.

27. *(new)* The method of Claim 25 further comprising determining whether at least one of the calculated probabilities corresponding to the time slices in the subset are less than or equal to a threshold value.

28. *(new)* The method of Claim 25 further comprising determining whether all of the calculated probabilities corresponding to the time slices in the subset are less than or equal to a threshold value.

29. *(new)* The method of Claim 25, 27 or 28 where the size of the subset is in the range from 1 to 1000.

30. *(new)* The method of Claims 25, 27 or 28 where the counts are measured within a spectral window.

31. *(new)* The method of Claim 30 where the spectral window is comprised of at least one energy channel.

32. *(new)* A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by at least two detectors comprising the apparatus; and

Calculating a correlation of the measured counts with respect to either all of the at least two detectors or a subset of the at least two detectors.

33. *(new)* The method of Claim 32 where the correlation step is comprised of calculating for each of the at least two detectors, the probability that the radiation counts from the detector came from background and determining whether all of the calculated probabilities are less than a threshold value.

34. *(new)* The method of Claim 32 where the correlation step is comprised of calculating for each of the at least two detectors, the probability that the radiation counts from the detector came from background and determining whether at least one of such calculated probabilities are less than a threshold value.

35. *(new)* The method of Claims 32, 33 or 34 where the measurement step detects counts within a pre-determined spectral window.

36. *(new)* The method of Claim 35 where the spectral window is comprised of at least one energy channel.

37. *(new)* A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by a plurality of detectors comprising the apparatus; and

Calculating for each detector within a subset of the plurality of detectors the probability that the radiation counts for that detector came from background.

38. *(new)* The method of Claims 37 where the subset size is between 1 and the number of detectors in the plurality.

39. *(new)* The method of Claim 37 further comprising determining whether at least two of the calculated probabilities corresponding to the detectors in the subset are less than the threshold value.

40. *(new)* The method of Claim 37 further comprising whether all of the calculated probabilities corresponding to the detectors in the subset are below a threshold value.

41. *(new)* The method of Claim 37, 39 or 40 where the size of the subset is in the range from 1 to 1000.

42. *(new)* The method of Claims 37, 39 or 40 where the counts are measured within a spectral window.

43. *(new)* The method of Claim 42 where the spectral window is comprised of at least one energy channel.

44. *(new)* The method of Claim 42 where the spectral window is comprised of between 1 and 255 energy channels.

45. (new) The method of Claim 42 where the number of energy channels used in the spectral window is determined by measuring the e^{-1} peak width as a function of peak channel number.

46. *(new)* A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring in each of the at least two detectors comprising the apparatus the individual approximate number of radiation counts during each of at least two time slices occurring approximately during the time period the source passes the apparatus; and

Calculating a correlation of the measured counts with respect to a subset of the at least two time slices together with a subset of the at least two detectors.

47. (*new*) The method of Claim 20 where the correlation step is comprised of determining whether the number of detected radiation counts in at least two of the time slices is greater than or equal to a threshold.

48. (*new*) The method of Claims 32 where the correlation step is comprised of determining whether the number of detected radiation counts in at least two of the detectors is greater than or equal to a threshold.

49. (*new*) The method of Claim 27 where there is no calculating of probabilities step, and the determining step is whether at least two of the radiation counts corresponding to the subset are greater than or equal to a threshold.

50. (new) The method of Claim 28 where there is no calculating of probabilities step, and the determining step is whether all of the radiation counts corresponding to the subset are greater than or equal to a threshold.

51. *(new)* The method of Claim 39 where there is no calculating of probabilities step, and the determining step is whether at least two of the radiation counts corresponding to the subset are greater than or equal to a threshold.

52. *(new)* The method of Claim 40 where there is no calculating of probabilities step, and the determining step is whether all of the radiation counts corresponding to the subset are greater than or equal to a threshold.

53. *(new)* The method of Claim 20 where the correlation step is comprised of calculating for each of the at least two time slices, the probability that the radiation counts in each time slice is from a source and determining whether at least two of the calculated probabilities are greater than or equal to a threshold.

54. *(new)* The method of Claims 32 where the correlation step is comprised of calculating for each of the at least two detectors, the probability that the radiation counts from each detector is from a source and determining whether at least two of the calculated probabilities are greater than or equal to a threshold.

55. *(new)* The method of Claim 25 where the first calculation step is calculating for each time slice within a subset of the plurality of time slices the probability that the radiation counts for the time slice came from a source and the determining step is whether at least two the calculated probabilities corresponding to the time slices in the subset are greater than or equal to a threshold.

56. *(new)* The method of Claim 25 where the first calculation step is calculating for each time slice within a subset of the plurality of time slices the probability that the radiation counts for the time slice came from a source and the determining step is whether all of the calculated probabilities corresponding to the time slices in the subset are greater than or equal to a threshold.

57. *(new)* The method of Claim 37 where the first calculation step is calculating for each detector within a subset of the plurality of detectors, the probability that the radiation counts from the detector came from a source and the determining step is whether at least two the calculated probabilities corresponding to the detectors in the subset are greater than or equal to a threshold.

58. *(new)* The method of Claim 37 where the first calculation step is calculating for each detector within a subset of the plurality of the detectors the probability that the radiation counts from the detector came from a source and the determining step is whether all of the calculated probabilities corresponding to the detectors in the subset are greater than or equal to a threshold.

59. (*new*) The method of Claims 21 or 39 where the threshold is between 10^{-4} and 10^{-8}.

60. (*new*) The method of Claims 22 or 40 where the threshold value is between 10^{-7} and 10^{-11}.

61. (*new*) The method of Claims 20, 21, 22, 47, 49, 50, 53, 55 or 56 where the time slices are between about .05 seconds and 1 second in width.

62. (*new*) The method of Claims 20, 21, 22, 47, 49, 50, 53, 55 or 56 where the time slice durations are less than about one-half of the time period.

63. (*new*) An apparatus for detecting low-level radioactive sources moving past the apparatus comprising:

At least one detector that generates an electrical signal as a result of its detection of a radiation count;

At least one analyzer, operatively coupled to the detector, where the analyzer determines the approximate number of radiation counts corresponding to at least one energy channel during at least one substantially distinct time slice during the approximate time period that the source passes the apparatus; and

At least one control computer operatively connected to the at least one analyzer where the control computer contains in its internal memory a computer program that uses the detected counts as data and alerts a hit when the program calculates a high degree of correlation among the detected counts for a subset of either the at least two detectors or the at least two time slices that is consistent with a radiation source.

64. (*new*) The apparatus of Claim 63 where the computer program calculates the probabilities for a spectral window comprised of at least one energy channel.

65. (*new*) The apparatus of Claim 63 where the detectors are comprised of either cesium iodide or high-purity germanium.

66. (*new*) An apparatus for detecting low-level radioactive sources moving past the apparatus comprising:

At least one detector that generates an electrical signal as a result of its detection of a radiation count;

At least one analyzer, operatively coupled to the detector, where the analyzer determines the approximate number of radiation counts corresponding to at least one energy channel during at least one substantially distinct time slice during the approximate time period that the source passes the apparatus; and

At least one control computer operatively connected to the at least one analyzer where the control computer, when operated in the apparatus, causes the apparatus to perform the methods claimed in any one of Claims 20 to 62.

67. *(new)* A medium for storing digital data having a computer program recorded thereon, such that when the program is loaded onto a computer and run, the computer will, when operatively connected to at least one analyzer that is operatively connected to at least one detector, execute the methods as claimed in any one of Claims 20 to 62.